MSC Guidelines for Review of Firemain – Small Passenger Vessel

Procedure Number: E1-9T Revision Date: 3/5/03

References

a) Navigation and Vessel Inspection Circular No. 6-72, Chg. 1, Guide to Fixed Fire Fighting Equipment Aboard Merchant Vessels
b) The International Convention for the Safety of Life at Sea (SOLAS), 1974, and its Protocol of 1978
c) 46 CFR 181.300 (Sub Chapter "T") Fire Main System, Details
d) 46 CFR 58.60 (Sub Chapter "F") Materials

Disclaimer

These guidelines were developed by the Marine Safety Center as an aid in the preparation and review of vessel plans and submissions. They were developed to supplement existing guidance. They are not intended to substitute or replace laws, regulations, or other official Coast Guard policy documents. The responsibility to demonstrate compliance with all applicable laws and regulations still rests with the plan submitter. The Coast Guard and the U. S. Department of Homeland Security expressly disclaim liability resulting from the use of this document.

Contact Information

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General Review Guidance

Fire Pumps

- Vessels must be fitted with fire pumps as outlined in Table 1 of this document.
- The fire pump must be capable of projecting a hose stream from the highest hydrant, through the required hose and nozzle, a distance of 7.6 meters (25 feet). 46 CFR 181.300(c).
- The fire pump must be permanently connected to the fire main and may be connected to the bilge system per 181.300(d).
- The fire pump must be capable of both remote operation from the operating station and local operations at the pump per 46 CFR 181.300(e)
- The fire pump outlet must be fitted with a pressure gauge per 46 CFR 181.300(b).

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Fire Main and Hydrants

- A vessel that has a power driven fire pump must have a sufficient number of fire hydrants to reach any part of the vessel using a single length of fire hose per 181.310(a).
- Each fire hydrant must have a valve installed to allow the fire hose to be removed while the fire main is under pressure per 46 CFR 181.310(c).

Fire Hose and Nozzles

- (a) A fire hose with a nozzle must be attached to each fire hydrant at all times per 46 CFR 181.320(a)
- Hoses temporarily removed from fire hydrants due to heavy weather or cargo handling operations must be stored in nearby accessible locations per 46 CFR 181.320(a).

Vessels 65 ’or less in length carrying more than 49 passengers or vessels more than 65 ’in length

- Fire hoses must be commercial lined conforming to Underwriters Laboratory (UL) 19 ``Lined Fire Hose and Hose Assemblies," or be listed and labeled by an independent laboratory recognized by the Commandant as being equivalent in performance per 46 CFR 181.320(b)(1).
- Fire hoses must be 15.25 meters (50 feet) in length and 40 millimeters (1.5 inches) in diameter per 46 CFR 181.320(b)(2)
- Fire hoses fittings must be of brass or other suitable corrosion-resistant material that comply with National Fire Protection Association (NFPA) 1963 ``Standard for Fire Hose Connections," or other standard specified by the Commandant per 46 CFR 181.320(b)(3).
- The fire nozzle must be of a type approved in accordance with approval series 162.027; or be of a type recognized by the Commandant as being equivalent in performance per 46 CFR 181.320(d)(1)&(2).

Vessels less than 65 ’in length carrying not more than 49 passengers

- Fire hoses may be commercial lined as noted above, with fittings as noted above, or be a garden type hose of not less than 16 millimeters (0.625 inches) nominal inside diameter per 46 CFR 181.320(c)(1).

- Fire hoses must be of one piece not less than 7.6 meters (25 feet) and not more than 15.25 meters (50 feet) in length per 46 CFR 181.320(C)(2).
- Garden type fire hoses must be of a good commercial grade constructed of an inner rubber tube, plies of braided fabric reinforcement, and an outer cover of rubber or equivalent material, and of sufficient strength to withstand the maximum pressure that can be produced by the fire pump per 46 CFR 181.320(c)(3).
- All fittings on a garden type hose must be of suitable corrosion-resistant material per 46 CFR 181.320(c)(3).
- Each nozzle on a garden type hose must be of corrosion-resistant material and be capable of being changed between a solid stream and a spray pattern per 46 CFR 181.320(d).

- **Piping**
- Piping, valves, and fittings in a fire main system must comply with subpart G, part 182, and be otherwise acceptable to the OCMI per 46 CFR 182.700.
- Aluminum firemain piping is acceptable on aluminum hulled vessels per 46 CFR 182.730(a)(3) so long as a fixed CO2 system is installed in high risk fire areas in order to protect the firemain piping as required by 46 CFR 182.730(b)(1).
- If acceptable to the cognizant OCMI, nonferrous metallic piping with a melting temperature above 927 deg. C (1,700 deg. F) may be used in vital systems that are deemed to be galvanically compatible per 46 CFR 182.730(a)(4).
- Note: Melting Points:

Aluminum:	1220°F
Copper:	1981°F
Iron	2802°F

- Provisions must be made to protect piping systems using aluminum alloys in high risk fire areas due to the low melting point of aluminum alloys per 46 CFR 182.730(b)(1). (MSC recognizes fixed CO2 systems)
- Provisions must be made to prevent or mitigate the effect of galvanic corrosion due to the relative solution potentials of copper, aluminum, and alloys of copper and aluminum, which are used in conjunction with each other, steel, or other metals and their alloys per 46 CFR 182.730(b)(2).
- Suitable thread compound must be used in making up threaded joints in aluminum pipe to prevent seizing per 46 CFR 182.730(b)(3).
- Pipe in the annealed temper must not be threaded per 46 CFR 182.730(b)(3).
- The use of aluminum alloys with a copper content exceeding 0.6 percent is prohibited per 46 CFR 182.730(b)(4).

Subchapter T	Description	Capacity and/or PSI
(T)	**46 CFR 181.300**	
(Vessels less than 100 GT carrying 150 or less passengers or having overnight accommodations for 49 or less)	Vessels over 65 ’and vessels less than 65 ’ carrying more than 49 passengers.	1 self-priming, power driven pump, 50 GPM, 60 psi minimum on gauge at outlet of pump
	Ferry vessels not more than 65 ’carrying not more than 49 passengers	1 self-priming, power driven pump,10 GPM minimum - psi unspecified
	Vessels not more than 65 ’carrying 49 or less passengers.	No power pump required. Vessel must have fire buckets per 46 CFR 181.610
	Table 1	

Attachments

Attachment 1: **FIRE PUMP LOCATION / SEPARATION OF SPACES**
Attachment 2: **SOLAS REVIEW GUIDE - FIRE MAIN**